CSc 3320: Systems Programming
Spring 2021
Homework
2: Total points 100

1. Create a Google doc for each homework assignment submission. 2. Start your responses from page 2 of the document and copy these instructions on page 1. 3. Fill in your name, campus ID and panther # in the fields provided. If this

   information is missing in your document TWO POINTS WILL BE DEDUCTED per submission.

4. Keep this page 1 intact on all your submissions. If this *submissions instructions* page is missing in your submission TWO POINTS WILL BE DEDUCTED per submission.

5. Each homework will typically have 2-3 PARTS, where each PART focuses on specific topic(s).

6. Start your responses to each PART on a new page.

7. If you are being asked to write code copy the code into a separate txt file and submit that as well.

8. If you are being asked to test code or run specific commands or scripts, provide the evidence of your outputs through a screenshot and copy the same into the document.

9. Upon completion, download a .PDF version of the document and submit the same.

Full Name:

Campus ID:

Panther #:

PART 1 (2.5 points each): 10pts

1. What are the differences among **grep, egrep and fgrep**? Describe using an example.

   Grep is used to search for lines that match a regular expression, Egrep is similar, but it's set so that it sorts for extended regular expressions as opposed to just regular expressions. Fgrep is

similar, but it just prints the line with the matching expression. For example, a command like $grep "example" example_file would have it so that all lines with the world example would be shown, fgrep has a very similar function as $fgrep "example" example_file would have the same result. Because egrep can use extended regex, a command like $egrep '^[a-zA-Z]+$' example file would work.

2. Which utility can be used to compress and decompress files? And how to compress multiple files into a single file? Please provide one example for it.

$gzip examplefile would work for compressing files, and to uncompress, $gzip -d examplefile would work. To compress multiple files, the tar command would suffice. A command like $tar cvf CompressedFile.tar file1 file2 would compress file 1 and 2 into CompressedFile.tar.

3. Which utility (or utilities) can break a line into multiple fields by defining a separator? What is the default separator? How to define a separator manually in the command line? Please provide one example for defining the separator for each utility.

The awk utility. Fields are normally separated by whitespaces and what not, such as space, tab, newline, etc. To manually define a separator, just place the new separator thing next to -F in the awk command. Example:

Awk -F ":"

4. What does the **sort** command do? What are the different possible fields? Explain using an example.

It can sort the contents of a file in a variety of ways, such as numerical order and alphabetical order. The default sort command will sort the contents in alphabetical order, the command sort examplefilename would sort the contents of said file alphabetically.

5. What is the output of the following sequence of bash commands: **echo 'Hello World' | sed 's/$/!!!/g'**

   Hello World!!!

6. What is the output for each of these awk script commands?

   -- 1 <= NF { print $5 }

   Prints the fifth item of each line in a file
   -- NR >= 1 && NR >= 5 { print $1 }
   Prints the first line after deleting lines 1-5
   -- 1,5 { print $0 }
   Prints the current line
   -- {print $1 }
   Prints the first line

7. What is the output of following command line:
   echo good | sed '/Good/d'
   good

8. Which **awk** script outputs all the lines where a plus sign + appears at the end of line?

awk '/\+$/{print $0}' examplefile.txt

9. What is the command to delete only the first 5 lines in a file "foo"?
   Which command deletes only the last 5 lines?

$awk 'NR > 5 { print }' < foo.txt

$head -n -5 foo.txt

Part IIb (10pts each): 50pts

Describe the function (5pts) and output (5pts) of the following commands.

9. **$ cat float**
   Wish I was floating in blue across the sky, my imagination is
   strong, And I often visit the days
   When everything seemed so clear.
   Now I wonder what I'm doing here at all...
   $cat float shows the catalogue/content of float, which happens to be a nice
   little story of sorts.
   $ cat h1.awk
   $ cat h1.awk shows the contents of the h1.awk file
   NR>2 && NR<4{print NR ":" $0 Missed a bracket?
   Adds a break after :, lists the line number before line 4

   $ awk '/.*ing/ {print NR ":" $1}' float

   Shows the first word of each line that contains "ing" in the float file,

   1:Wish

   2:When

   3:Now

10. As the next command following question 9,
   $ awk -f h1.awk float

Made a new separator at :, also listed the line number before the last line
Wish I was floating in blue across the sky, my imagination is strong, And I often visit the days
When everything seemed so clear.
3
Now I wonder what I'm doing here at all...

11. Just going to mention that the conversion to pdf messed up the wording of the code a bit.

$ **cat h2.awk**

Shows the content of h2.awk

"Start to scan file" } BEGIN { print
{print $1 "," $NF}

END {print "END-" , FILENAME }
$ **awk -f h2.awk float**

~$ awk -f h2.awk float
Start to scan file
Wish,days
When,clear.
Now,all...
END- float
Prints the first land last word in each line

12. sed 's/\s/\t/g' float

Globally replace space with tab, changing up the spacing of the file float

~$ sed 's/\s/\t/g' float

Wish I was floating in blue across the sky, my imagination is
strong, And I often visit the days

When everything seemed so clear.

Now I wonder what I'm doing here at all...

13.

$ ls *.awk| awk '{print "grep --color 'BEGIN' " $1 }' |sh *(Notes: **sh file** runs file as a shell script . $1 should be the output of 'ls *.awk ' in this case, not the 1ˢᵗ field)*

~$ ls *.awk| awk '{print "grep --color 'BEGIN' " $1 }' |sh

BEGIN { print "Start to scan file" }

14.

$ mkdir test test/test1 test/test2

Created a file named test with files test1 and test2 inside.

$cat>test/testt.txt

Created a text file in the test folder

This is a test file ^D

$ cd test

Move to the test folder

$ ls -l **.** | grep '^d' | awk '{print "cp -r " $NF " " $NF ".bak"}' | sh Creates a bak folder for all folders in the test folder, each bak folder holds another folder based on the folder it was based on.

Part III Programming: 15pts
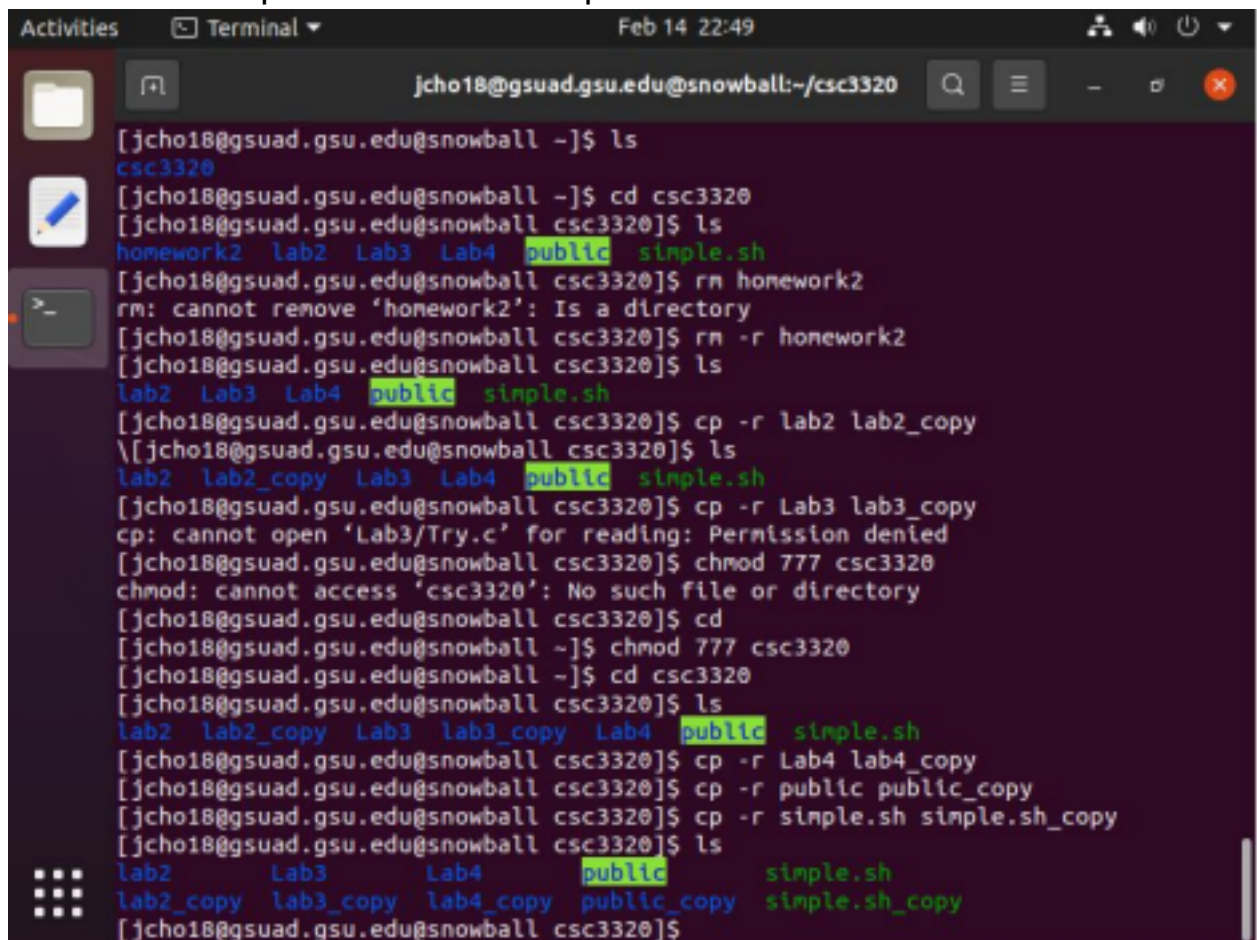**I did the parts above in a separate unix client out of laziness reasons, if you'd like to see the work or what not, please tell me.**

15. Sort all the files in your class working directory (or your home directory) as per the following requirements:

a. A copy of each file in that folder must be made. Append the string "_copy" to the name of the file

b. The duplicate (copied) files must be in separate directories with each directory specifying the type of the file (e.g. txt files in directory named

txtfiles, pdf files in directory named pdffiles etc).

   c. The files in each directory must be sorted in chronological order of months.

   d. An archive file (.tar) of each directory must be made. The .tar files must be sorted by name in ascending order.

   e. An archive file of all the .tar archive files must be made and be available in your home directory.

As an output, show your screen shots for each step or a single screenshot that will cover the outputs from all the steps.

a.

jcho18@gsuad.gsu.edu@snowball:~/csc3320

```
lab2  lab2_copy  Lab3  Lab4  public  simple.sh
[jcho18@gsuad.gsu.edu@snowball csc3320]$ cp -r Lab3 lab3_copy
cp: cannot open 'Lab3/Try.c' for reading: Permission denied
[jcho18@gsuad.gsu.edu@snowball csc3320]$ chmod 777 csc3320
chmod: cannot access 'csc3320': No such file or directory
[jcho18@gsuad.gsu.edu@snowball csc3320]$ cd
[jcho18@gsuad.gsu.edu@snowball ~]$ chmod 777 csc3320
[jcho18@gsuad.gsu.edu@snowball ~]$ cd csc3320
[jcho18@gsuad.gsu.edu@snowball csc3320]$ ls
lab2  lab2_copy  Lab3  lab3_copy  Lab4  public  simple.sh
[jcho18@gsuad.gsu.edu@snowball csc3320]$ cp -r Lab4 lab4_copy
[jcho18@gsuad.gsu.edu@snowball csc3320]$ cp -r public public_copy
[jcho18@gsuad.gsu.edu@snowball csc3320]$ cp -r simple.sh simple.sh_copy
[jcho18@gsuad.gsu.edu@snowball csc3320]$ ls
lab2        Lab3        Lab4        public      simple.sh
lab2_copy   lab3_copy   lab4_copy   public_copy  simple.sh_copy
[jcho18@gsuad.gsu.edu@snowball csc3320]$ mkdir directories
[jcho18@gsuad.gsu.edu@snowball csc3320]$ mkdir bashfile
[jcho18@gsuad.gsu.edu@snowball csc3320]$ ls
bashfile     lab2        Lab3        Lab4        public      simple.sh
directories  lab2_copy   lab3_copy   lab4_copy   public_copy  simple.sh_copy
[jcho18@gsuad.gsu.edu@snowball csc3320]$ mv lab2_copy directories
[jcho18@gsuad.gsu.edu@snowball csc3320]$ mv lab3_copy directories
[jcho18@gsuad.gsu.edu@snowball csc3320]$ mv lab4_copy directories
[jcho18@gsuad.gsu.edu@snowball csc3320]$ mv public_copy directories
[jcho18@gsuad.gsu.edu@snowball csc3320]$ mv simple.sh_copy bashfile
[jcho18@gsuad.gsu.edu@snowball csc3320]$ ls
bashfile  directories  lab2  Lab3  Lab4  public  simple.sh
[jcho18@gsuad.gsu.edu@snowball csc3320]$
```

b.

```
[jcho18@gsuad.gsu.edu@snowball directories]$ ls -lt
total 16
drwxrwxr-x. 4 jcho18@gsuad.gsu.edu jcho18@gsuad.gsu.edu 4096 Feb 14 22:48 public_copy
drwxrwxr-x. 2 jcho18@gsuad.gsu.edu jcho18@gsuad.gsu.edu 4096 Feb 14 22:48 lab4_copy
drwxrwxr-x. 2 jcho18@gsuad.gsu.edu jcho18@gsuad.gsu.edu 4096 Feb 14 22:47 lab3_copy
drwxrwxr-x. 2 jcho18@gsuad.gsu.edu jcho18@gsuad.gsu.edu 4096 Feb 14 22:46 lab2_copy
[jcho18@gsuad.gsu.edu@snowball directories]$
```

c.

```
[jcho18@gsuad.gsu.edu@snowball directories]$ tar -cvf archive.tar lab2_copy lab
3_copy lab4_copy public_copy
lab2_copy/
lab2_copy/myLab2.txt
lab3_copy/
lab3_copy/Try.c.
lab3_copy/RealEstate.csv.
lab3_copy/RealEstate.csv
lab3_copy/vi
lab3_copy/test.txt
lab4_copy/
lab4_copy/CSC_Course.txt
lab4_copy/newList.txt
lab4_copy/mountainList.txt
public_copy/
public_copy/Submission/
public_copy/Submission/Lab3/
public_copy/Submission/Lab2/
public_copy/Submission/Lab2/Lab2_P2/
public_copy/Submission/Lab2/Lab2_P2/RealEstate.csv
public_copy/myRealEstate.csv
public_copy/Others/
[jcho18@gsuad.gsu.edu@snowball directories]$ ls
archive.tar  lab2_copy  lab3_copy  lab4_copy  public_copy
d. [jcho18@gsuad.gsu.edu@snowball directories]$
```

jcho18@gsuad.gsu.edu@snowball:~/csc3320

```
lab4_copy/newList.txt
lab4_copy/mountainList.txt
public_copy/
public_copy/Submission/
public_copy/Submission/Lab3/
public_copy/Submission/Lab2/
public_copy/Submission/Lab2/Lab2_P2/
public_copy/Submission/Lab2/Lab2_P2/RealEstate.csv
public_copy/myRealEstate.csv
public_copy/Others/
[jcho18@gsuad.gsu.edu@snowball directories]$ ls
archive.tar  lab2_copy  lab3_copy  lab4_copy  public_copy
[jcho18@gsuad.gsu.edu@snowball directories]$ pwd
/home/jcho18/csc3320/directories
[jcho18@gsuad.gsu.edu@snowball directories]$ mv archive.tar /home
mv: cannot move 'archive.tar' to '/home/archive.tar': Permission denied
[jcho18@gsuad.gsu.edu@snowball directories]$ mv archive.tar /home/jcho18/csc332
0
[jcho18@gsuad.gsu.edu@snowball directories]$ ls
lab2_copy  lab3_copy  lab4_copy  public_copy
[jcho18@gsuad.gsu.edu@snowball directories]$ cd csc3320
-bash: cd: csc3320: No such file or directory
[jcho18@gsuad.gsu.edu@snowball directories]$ cd
[jcho18@gsuad.gsu.edu@snowball ~]$ ls
csc3320
[jcho18@gsuad.gsu.edu@snowball ~]$ cd csc3320
[jcho18@gsuad.gsu.edu@snowball csc3320]$ ls
archive.tar  bashfile  directories  lab2  Lab3  Lab4  public  simple.sh
[jcho18@gsuad.gsu.edu@snowball csc3320]$
```

e.